

15. (Amended) The method of washing a photomask in accordance with claim 1,

02 wherein said phase-shift photomask is formed with an MoSiON film.

### REMARKS

Claims 1-7 and 15 are pending.

#### THE DOUBLE PATENTING REJECTION

Claims 1-7 and 15 were rejected on the grounds of obviousness-type double patenting over claims 10 and 11 of U.S. Pat. No. 6,277,205. The Examiner alleged that, although the conflicting claims are not identical, they are not patentably distinct from the presently pending claims. The '205 application recites and claims use of "cathodic water" to remove foreign objects attached to the surface of a photomask (see cl. 10).

This rejection is traversed. Despite the Examiner's assertion that the transition claim phrase "comprising" is open-ended and does not exclude unrecited elements or method steps, the Examiner's approach is legally erroneous. The recited sequence of steps cannot simply be ignored. *In re Freed*, 425 F.2d 785, 165 USPQ 570 (CCPA 1970). The claim recites a method of washing a photomask "*comprising first to third steps of*" removing organic matter, removing foreign matter, and drying. The recited sequence of steps, which is expressly claimed, cannot simply be ignored.

The omission of elements from prior art devices or methods is not *per se* obvious and it is incumbent upon the Examiner to demonstrate why the omission would have been obvious in light of the prior art teachings without relying upon Applicants' disclosure. *Ex parte Kaiser*, 189 USPQ 816, 816 (PTO Bd. of App. 1974); *Panduit Corp. v. Dennison Mfg. Co.*, 227 USPQ 337, 341, 344

(Fed. Cir. 1985), *remanded on other grounds* 106 S.Ct. 1578, 229 USPQ 478, *on remand* 1 USPQ2d 1593 (Fed. Cir. 1987). The omission of a step is particularly relevant in methods involving chemical steps and can make or break a chemical reaction. As taught by Applicants, the reduced usage of chemicals and reduced consumption of high purity water achieved by the invention (see page 3, lines 23-25) are significant advantages over the prior art.

It is accordingly submitted that the Examiner has not met the minimal threshold for establishing a *prima facie* case of obviousness under the doctrine of obviousness-type double patenting. Reconsideration and withdrawal of this rejection is requested.

**THE PROVISIONAL 35 U.S.C. § 103(A) REJECTION OVER THE '205 PATENT**

The Examiner states that the commonly assigned '205 patent would form a basis for rejection under 35 U.S.C. § 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. § 102(f) or (g) and the inventions were not commonly owned at the time of the invention.

The Examiner required proof that the present invention and the '205 patented invention were commonly owned (by assignment or obligation of assignment) at the time of filing of the present invention.

Attached is a copy of the Assignment filed in U.S. Application Serial No. 09/122763, which led to the '205 patent. The assignment is unto:

"MITSUBISHI DENKI KABUSHIKI KAISHA of 2-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-8310 Japan; M. WATANABE CO., LTD. of 4-2-16, Nihonbashimuromachi, Chuo-ku, Tokyo 103-0022 Japan; and Organo Corporation of 2-8, Shinsuna 1-chome, Koto-ku, Tokyo, Japan". This Assignment was executed on July 21, 1998.

As the Examiner can verify, the Assignment of the present application, received by the USPTO on May 25, 2000, lists as the assignees:

"(1) Mitsubishi Denki Kabushiki Kaisha of 2-3, Marunouchi 2-chome, Chiyoda-ku,  
TOKYO 100-8310 JAPAN

(2) ORGANO COPRPORATION of 2-8, Shinsuna 1-chome, Koto-ku, TOKYO, JAPAN

(3) M. WATANABE CO., LTD. of 4-2-16, Nihonbashimuromachi, Chuo-ku, TOKYO  
103-0022 JAPAN"

Therefore, the present invention and the '205 patented invention were commonly owned  
(by assignment) at the time of filing of the present invention and the '205 patent does not qualify  
as prior art and would not properly form the basis for a rejection under 35 U.S.C. § 103.

Withdrawal of this provisional rejection is requested.

**THE 35 U.S.C. § 112 REJECTION**

Claims 1-7 and 15 were rejected under 35 U.S.C. § 112, second paragraph, as being  
indefinite. This rejection is traversed.

The Examiner is alleging claim 1's step of "removing foreign matter" is unclear in view  
of the step reciting "removing organic matter and metal impurities".

It is submitted that one skilled in the art would, in view of the specification, understand  
the differences between these claim terms and would understand the meaning of "foreign matter"  
in relation to the claimed and disclosed steps (see, e.g., page 2, lines 1-2 and lines 29-30).

Reconsideration and withdrawal of this rejection is requested.

**THE 35 U.S.C. § 102 REJECTIONS**

Claims 1-3, 5-7 and 15 are being rejected under 35 U.S.C. § 102(e) as being anticipated  
by **Nagamura et al.** (U.S. Pat. No. 6,277,205 B1).

Claims 1-3, 5-7 and 15 are also being rejected under 35 U.S.C. § 102(a)/102(e) as being anticipated by a divisional (**Nagamura et al.** (U.S. Pat. No. 6,071,376)) to **Nagamura et al.** (U.S. Pat. No. 6,277,205 B1).

Claim 1 presently recites a method of washing a photomask comprising first to third steps of: removing organic matter and metal impurities present on the surface of a photomask; removing foreign matter adhering to said surface of said photomask with H<sub>2</sub> gas dissolved water; and drying said photomask, wherein said photomask is a phase-shift mask including halftone mask, said H<sub>2</sub> gas dissolved water contains ammonia and the concentration of said ammonia is not more than 1%.

Neither **Nagamura et al.** '376 nor '205 teach a method of washing a photomask comprising first to third steps of: removing organic matter and metal impurities present on the surface of a photomask; removing foreign matter adhering to said surface of said photomask with H<sub>2</sub> gas dissolved water; and drying said photomask, *wherein said photomask is a phase-shift mask including halftone mask, said H<sub>2</sub> gas dissolved water contains ammonia and the concentration of said ammonia is not more than 1%.*

Reconsideration and withdrawal of these rejections are requested.

**THE 35 U.S.C. § 103 REJECTIONS**

Claims 1-7 are being rejected under 35 U.S.C. § 103(a) as being unpatentable over **Yeol et al.** (U.S. Pat. No. 6,039,815).

Claim 4 is being rejected under 35 U.S.C. § 103(a) as being unpatentable over **Nagamura et al.** ('205 or '376) in view of **Eiu-Yeol** (U.S. Pat. No. 6,035,871).

**Yeol et al.** are cited as teaching a cleaning apparatus for semiconductor processing (col. 1, lines 8-10) wherein a hydrogen water is mixed with one of an alkaline or acidic solution (col.

8, lines 28-43), such alkaline solutions including  $\text{NH}_4\text{OH}$  (aqueous ammonia/ammonia hydroxide) and  $\text{KOH}$  (potassium hydroxide)(see col. 5, lines 50-55). The cleaning may be achieved by jetting, spin cleaning, or flow cleaning, alone or in combination with ultrasonic waves (col. 6, lines 20-30). The hydrogen solution may have a concentration of 1-2 PPM (col. 10, lines 46-50). The concentration of the aqueous ammonia solution is 2mmol/l (col. 10, lines 39-45) and the pH was about 10 (see Fig. 4B).

However, Yeol et al. and Eiu-Yeol are unable to make up for the deficiencies of Nagamura et al. in that neither reference teaches a method of washing a photomask comprising first to third steps of: removing organic matter and metal impurities present on the surface of a photomask; removing foreign matter adhering to said surface of said photomask with  $\text{H}_2$  gas dissolved water; and drying said photomask, *wherein said photomask is a phase-shift mask including halftone mask, said  $\text{H}_2$  gas dissolved water contains ammonia and the concentration of said ammonia is not more than 1%.*

One advantage achieved by the claimed invention, wherein the ammonia concentration is not more than 1%, is that the variation in the transmittance can be suppressed below the management criterion


Accordingly, the claimed combinations of references fails to teach or suggest each and every element of the claimed invention and fails to render the claimed invention obvious under 35 U.S.C. § 103. Reconsideration and withdrawal of this 35 U.S.C. § 103 rejection is requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment in compliance with revised 37 C.F.R. § 1.121. The attached pages are captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

A handwritten signature in black ink, appearing to read 'W D Pegg', written over the printed name.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

The claims have been amended as follows:

1. (Amended) A method of washing a photomask comprising first to third steps of:  
removing organic matter and metal impurities present on the surface of a photomask;  
removing foreign matter adhering to said surface of said photomask with H<sub>2</sub> gas  
dissolved water; and  
drying said photomask,  
wherein said photomask is a phase-shift mask including halftone mask, said H<sub>2</sub> gas  
dissolved water contains ammonia and the concentration of said ammonia is not more than 1%.

15. (Amended) The method of washing a photomask in accordance with claim 1,  
wherein said [photomask includes a halftone] phase-shift photomask is formed with an MoSiON  
film.